

## **DETAILED ACTION**

1. A decision from the Board of Patent Appeals and Interferences was made on the appealed action, the decision of which was made of record on May 3, 2011. In view of the decision and the examiner's amendment below, the claims are in condition for allowance.

## **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

3. Authorization for this examiner's amendment was given in a telephone interview with Gary Cohn on June 7, 2011.

4. The application has been amended as follows:

The applicant agreed to incorporate the limitations of instant claim 24 into claim 27 and to cancel claim 24. The applicant agreed to make claim 30 an independent claim, reciting the process limitations of instant claim 27.

Claim 27 now recites:

"A process that comprises forming a pressurized, molten mixture of a melt-processable polylactide resin containing about 5 to about 15% by weight, based on the weight of the polylactide resin, of carbon dioxide, and extruding the

molten mixture at an extrusion temperature through a die to a region of reduced pressure such that the carbon dioxide expands and the polylactide resin simultaneously cools to form a stable foam, wherein the foam has least 70% closed cells and a crystallinity of about 13-24 J/g measured by differential scanning calorimetry, and wherein the polylactide resin contains at least 80% by weight polymerized lactic acid units."

Claim 30 now reads:

"A process that comprises forming a pressurized, molten mixture of a melt-processable polylactide resin containing 7-11% by weight, based on the weight of the polylactide resin, of carbon dioxide, and extruding the molten mixture at an extrusion temperature through a die to a region of reduced pressure such that the carbon dioxide expands and the polylactide resin simultaneously cools to form a stable foam having at least 70% closed cells, wherein the polylactide resin contains at least 80% by weight polymerized lactic acid units."

***Allowable Subject Matter***

5. Claims 27-32 are allowed.
6. The following is an examiner's statement of reasons for allowance:

The primary reason for allowance of claims 27-32 is the inclusion of a limitation that the foam produced according to the process of claim 27 has a

crystallinity of 13-24 J/g as measured by differential scanning calorimetry in instant claim 27, and the inclusion of the limitation of 7-11wt% carbon dioxide in instant claim 30.

The closest prior art reference is the following:

*Hammel et al.* (5,134,171)

7. *Hammel et al.* teach polyhydroxy acid foam materials comprising polylactic acid and carbon dioxide (column 2, lines 34-38 and column 2, line 60 - column 3, line 11). The polymer composition of the polyhydroxy acid foam of *Hammel et al.* comprises from 50-97%, and preferably from 85 to 96% of the L enantiomer of lactic acid, with additional lactic acid units being of the D enantiomeric configuration (column 4, lines 31-39). The polyhydroxy foam is produced using an extrusion system (Example 1, column 6, lines 35-61). Furthermore, the formed foam is subjected to heat treatment after the extrusion process, which will induce some degree of crystallinity (Example 1, column 6, lines 56-57). *Hammel et al.* further teach that at least 90% of the foam cells are closed cells before shaping (column 3, lines 43-45) or above 50% of the cells are closed after shaping. *Hammel et al.* further teach that the lactic acid-containing polymer may comprise long chain branching (column 2, lines 45 - column 3, line 5).

8. In one example (Example 1) of *Hammel et al.*, 25 lbs/hr of blowing agent is incorporated into 472.5 lbs/hour of molten polylactic acid (85% L, the remaining 15%

being D/L). This corresponds to 5 wt% blowing agent, the blowing agent of which may comprise carbon dioxide (see column 3, lines 46-50 and column 6, lines 35-45).

9. *Hammel et al.* fails to teach the crystallinity of the foam, let alone that the foam has a crystallinity of 13-24 J/g as measured by differential scanning calorimetry. The highest amount of blowing agent employed in the invention of *Hammel et al.* is 5wt% (Example 1), which is below the required 7-11wt% of instant claim 30. The instant specification teaches at page 10, line 27 – page 11, line 12 that the crystallinity achieved in the instant invention is due to the heat annealing step performed after the foam is formed. Because *Hammel et al.* does not disclose the conditions under which the foam formed in Example 1 is heated, the foam of *Hammel et al.* will not necessarily have the claimed crystallinity, nor would it be obvious, based on the disclosure of *Hammel et al.* to subject the formed foam to the heat annealing conditions of the instant application.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is

(571)270-7338. The examiner can normally be reached on Monday through Thursday 9:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571)272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Application/Control Number: 10/593,111  
Art Unit: 1766

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